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SUPERFUND PROPOSED REMEDIAL ACTION PLAN FOR GROUND WATER AT THE AUSTIN AVENUE RADIATION SITE DELAWARE COUNTY, PENNSYLVANIA

INTRODUCTION

The U.S. Environmental Protection Agency (EPA) has prepared this Proposed Remedial Action Plan to comply with Section 117(a) of the Comprehensive Environmental Response, Compensation and Liability Act, also known as the Superfund law, and to describe EPA's preferred remedial action for ground water at the Austin Avenue Radiation Site, Delaware County, Pennsylvania. EPA invites public comments on this course of action.

This Proposed Remedial Action Plan describes:

- The background of the Austin Avenue Radiation Site;
- The nature of the contamination;
- A description of the No Action Alternative; and
- The local availability of documents concerning the Austin Avenue Radiation Site for public review.

SITE BACKGROUND AND DESCRIPTION

The Austin Avenue Radiation Site consists of approximately 40 properties in the municipalities of Lansdowne Borough, Aldan Borough, East Lansdowne Borough, Darby Borough, Yeadon Borough and Upper Darby Township, in Delaware County, Pennsylvania. All of the properties are within a two-mile radius of the intersection of South Union Avenue and Austin Avenue in Lansdowne Borough (see Figure 1). Situated at the northwest corner of that intersection is a lot which was the site of the former W.L. Cummings Chemical Company ("Cummings") warehouse. Between approximately 1915 to 1922, Cummings conducted a radium processing operation at the warehouse. The Cummings operation is the suspected source of radium and thorium-contaminated tailings which have resulted in the contamination of the other Austin Avenue Radiation Site properties. It is also suspected that uranium-contaminated waste waters were discharged to the soil via cesspools near the former warehouse.

The history of the Austin Avenue Radiation Site is intertwined with that of a former Superfund site, the Lansdowne Radiation Site, which was a twin house located at 105-107 East Stratford Avenue in Lansdowne, Pennsylvania. A former University of Pennsylvania professor, Dr. Dicran Hadjy Kabakjian, owned the house at 105 East Stratford Avenue, and also worked for Cummings while the company conducted its radium refining operation at the warehouse.

While a professor at the University of Pennsylvania, Dr. Kabakjian developed a crystallization process for the refining of radium, and then sold the process to Cummings. He worked as a consultant to Cummings until 1924 when he set up his own radium processing business in the basement of his home at 105 East Stratford Avenue. The major product of his home business was radium-filled implant needles which were sold to medical professionals for the treatment of cancer.

The radium refining process developed by Dr. Kabakjian and practiced at Cummings' warehouse used a yellowish, shale-like material known as carnotite ore which was mined from deposits in Utah and Colorado. One ton of carnotite ore could produce approximately one-tenth of a grain of radium. During Cummings' years of operation at the Union Avenue warehouse, its radium output is estimated to have been three grams per year. The radium extraction process generated waste tailings, and these tailings contained two residual radionuclides, radium 226 and thorium 230. The tailings, which were sand-like waste materials, were either given or sold to local building contractors and others. During the seven years that Cummings operated at the warehouse, those persons used the tailings in mortar, stucco, plaster, and concrete which were used to build or renovate houses in the area. The ore processing also produced waste liquids containing uranium 238. These liquids were apparently dumped into cesspool systems in the immediate vicinity of the Cummings facility.

In 1963, the Pennsylvania Department of Health inspected the 105 East Stratford Avenue house and found extremely high levels of radiation. In 1964, the U.S. Public Health Service and the Pennsylvania Department of Health, aided by the U.S. Air Force, attempted to decontaminate the house. In 1984, EPA and Pennsylvania Department of Environmental Resources (PADER) sampling and monitoring of the structure showed high residual radiation contamination levels. An extensive evaluation of the house was conducted by the U.S. Department of Energy's Argonne National Laboratory. In 1986, EPA issued a Record of Decision (ROD) which called for the dismantlement and offsite disposal of the house and contaminated soils. It was at this time that the location of other tailings from the operation became an issue as the government suspected that the tailings would contain residual radiation contamination. No records relating to the ultimate disposition of those tailings were available.

In May 1991, PADER visited the South Union Avenue/Austin Avenue location to monitor for radon because radiation contamination had previously been discovered in the back yard of 133 Austin Avenue, the property adjacent the warehouse. During this visit, radiation survey instruments indicated the presence of significant levels of radioactive contamination within the house at that location. PADER obtained soil and wipe samples for further analysis.

On June 7, 1991, PADER notified EPA of its findings and requested assistance. A joint PADER-EPA site assessment confirmed the presence of radiological contamination at 133 Austin Avenue at levels that warranted immediate action. Based on the data provided by the PADER analyses and the results of the joint survey, the U.S. Agency for Toxic Substances and Disease Registry (ATSDR) recommended the relocation of the residents of the house at 133 Austin Avenue and the dismantlement of the warehouse.

On June 19, 1991, a team of radiation specialists from the EPA National Air and Radiation Environmental Laboratory (NAREL) in Montgomery, Alabama, arrived to conduct an assessment. The warehouse and the adjacent residential dwelling (133 Austin Avenue) were found to be heavily contaminated with radioactive materials. In November and December of 1991, EPA used a special radiation-detection van to conduct a 12.5 square mile search in Delaware County and a small portion of the adjacent City of Philadelphia. EPA also conducted radiological surveys of the properties which were suspected to be contaminated. The EPA testing showed that approximately 40 properties within a two-mile radius of the site of the former Cummings radium processing facility had become contaminated with radium 226 and thorium 230.

EPA has conducted Removal Actions at a number of the contaminated properties. Removal Actions were selected for those properties that posed an immediate endangerment and/or which could be addressed using Removal Action authorities within the constraints of available funding. These Removal Actions included the temporary relocation of residents of several of the properties; complete dismantlement of the warehouse at South Union and Austin Avenues; dismantlement of 133 Austin Avenue; soil removals at a number of the properties; and removals of plaster, stucco, and concrete at selected properties. The removal actions resulted in the complete cleanup of 19 of the identified properties. Relocated residents of those properties returned to their homes following the removal action cleanups.

On July 1, 1993, EPA issued a Proposed Remedial Action Plan describing five alternatives considered as possible remedial actions at the Site. That Plan also designated EPA's preferred alternative for each of the properties. In response to that Plan, EPA received numerous letters from citizens and public officials requesting that certain alternatives be considered or reconsidered. In addition, EPA had been conducting preliminary remedial design activities relative to 20 of the affected properties. Because of the additional information gained from the Remedial Design activities, and in consideration of the responses to the first Proposed Remedial Action Plan, a Revised Proposed Remedial Action Plan was developed and was offered for public comment on March 2, 1994. Subsequent to that second Plan, a Record of Decision (ROD) was issued on June 27, 1994. That ROD

delineated the selected remedies for buildings and soil, but deferred any decision on Site ground water to a later Record of Decision.

SCOPE AND ROLE OF THIS RESPONSE ACTION

This Proposed Remedial Action Plan addresses the remedial alternative selected for ground water near the former Cummings processing facility. It was only in the immediate vicinity of the former processing facility that Site-related ground water contamination was considered to be possible. That area includes small portions of both Upper Darby Township and the Borough of Lansdowne in Delaware County, Pennsylvania.

SUMMARY OF SITE RISKS

Geologically, the Austin Avenue Radiation Site is located in the piedmont physiographic province. The Site is underlain by approximately 10 to 20 feet of soil and unconsolidated material overlying gneiss and schist rock. The topography is generally level, with no obvious drainage direction. Drainage has been altered by storm drains and property development.

EPA's initial investigation of the Site included soil borings and sample analysis of soils for Site-related radionuclides during February and June 1993. Ground water was not sampled as part of that effort. Ground water was first investigated in four borings done in April 1994. The samples' analyses showed elevated levels of Total Uranium, and one sample contained high levels of radium 226. These levels were significantly above proposed and existing Maximum Contaminant Levels (MCLs) (the maximum concentrations of drinking water contaminants permissible in public water supplies under the federal Safe Drinking Water Act). Further investigation was required, in part to determine if the ground water samples that had been collected were representative.

In late March and early April 1995, EPA conducted a field investigation in the vicinity of the former Cummings processing facility in part to address concerns raised by the results of the previous samplings, and to determine the impact of Site-related radionuclides on the ground water. A report titled "Final Report, Austin Avenue Radiation Site, Soil and Groundwater Sampling Results" (July 1995) was generated to document the investigation. During that field work, 17 soil bore holes and temporary well points were installed (Figure 2). Ground water samples were obtained from 16 of these locations (sampling location SB-10 yielded no ground water). The samples were analyzed, both non-filtered and filtered, for Site-related radionuclides. Non-filtered samples showed slightly higher levels of radionuclides than the filtered samples. Filtered

samples are believed to be the most representative of the ground water that moves in the aquifer. This is because filtering removes suspended matter, such as soil particles, leaving only dissolved materials in the water samples. These filtered samples were used for risk assessment purposes.

No filtered ground water sample obtained during the investigation exceeded the MCL for any of the Site-related radionuclides. The proposed MCL for uranium in drinking water is 30 picocuries per liter (pCi/l). The highest uranium concentration found in a filtered ground water sample during the investigation was 9.1 pCi/l in ground water obtained from sampling location SB-6 (Table 1). The MCL for combined radium 226 and radium 228 is 5 pCi/l. The highest radium 226 concentration detected in a filtered ground water sample was 1.3 pCi/l obtained from sampling location SB-14. (Radium 228 is much more rare than radium 226, and although not analyzed for specifically, would, in any event, contribute insignificantly to the total radium concentration.) There is no current standard for thorium in drinking water, however, the MCL for alpha emitters (of which thorium 230 is one), excluding radium and uranium, is 15 pCi/l. No filtered ground water sample exceeded this limit for thorium 230.

In addition to the finding of no exceedances of MCLs, there are no known users of the ground water aquifer in the area covered by this investigation. All drinking water in the area is furnished via waterline from municipal water sources which are located miles from the Site.

Description of The "No Action" Alternative

The No Action alternative, which EPA is required to consider under the NCP, involves no remedial action for the ground water. This alternative would not require the expenditure of funds for ground water remediation at the Site. No applicable or relevant and appropriate requirements (ARARs) are associated with this alternative.

State Acceptance

The Commonwealth of Pennsylvania, Department of Environmental Protection, has reviewed this Proposed Remedial Action Plan and concurs with it.

Community Acceptance

Community response to the No Action alternative will be evaluated after the public comment period, and that response will be described in the Record of Decision for the Ground Water

Operable Unit.

Comment Invited

EPA relies on public input to ensure that the remedy selected for each Superfund site meets the needs of the local community in addition to being an effective solution to the problem. To this end, EPA will hold a public comment period on this Proposed Remedial Action Plan to provide citizens with an opportunity to comment on the No Action alternative. EPA, in consultation with the Commonwealth of Pennsylvania, may modify the preferred alternative or select another response action based on new information or public comments. Therefore, the public is encouraged to consider the No Action alternative, and to provide comments to EPA.

A public comment period on the Proposed Remedial Action Plan will begin July 7, 1996 and will conclude August 6, 1996. Additionally, a Public Meeting is scheduled for July 31, 1996 from 7:00 p.m. to 9:00 p.m. at the Lansdowne Borough Hall, 12 East Baltimore Avenue, Lansdowne, PA. Citizens are encouraged to review site-related documents and to attend the Public Meeting to discuss any concerns regarding the Proposed Remedial Action Plan with EPA. To submit written comments or to request an extension of the public comment period, citizens should write to:

Ms. Carrie Deitzel (3EA30)
Superfund Community Involvement Coordinator
U.S. EPA, Region III
841 Chestnut Building
Philadelphia, PA 19107
(telephone: 215-566-5525)

All comments must be received by EPA before the conclusion of the public comment period.

Based on the findings of the EPA's investigation and the public comments received, EPA will select a remedy for the ground water at the Austin Avenue Site. The remedy selected will be documented in a Record of Decision (ROD) that summarizes EPA's decision process. At this time, EPA expects the ROD to be finalized in September 1996.

Copies of Site-related documents are available for public review at the information repository located at:

Borough of Lansdowne Public Library
Nyack and Lansdowne Avenues
Lansdowne, PA 19050

Figure 1

The map above of eastern Delaware County outlines the two-mile radius where EPA's scanner van measured for radium.

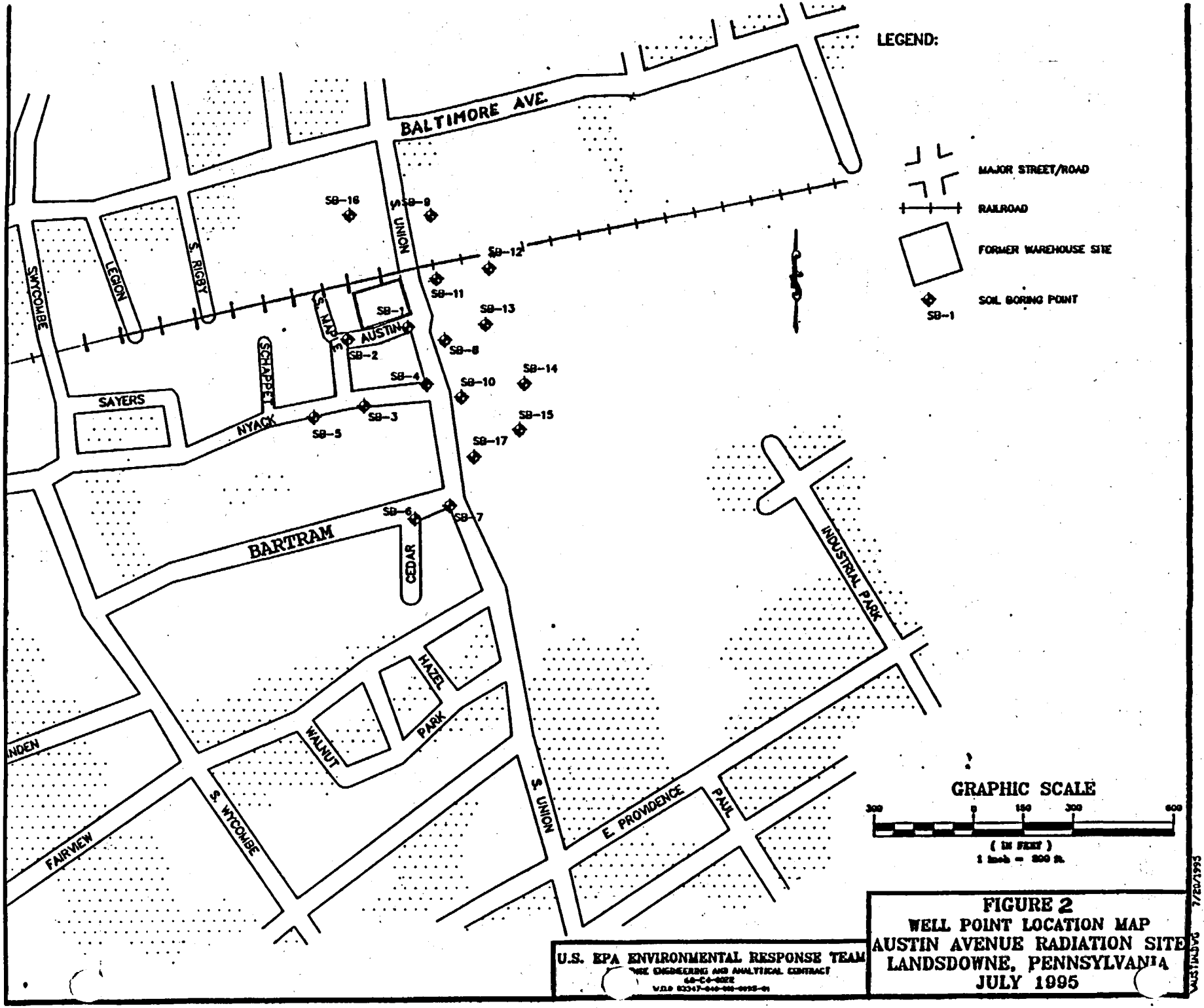
LEGEND:
MAJOR STREET/ROAD
RAILROAD
FORMER WAREHOUSE SITE
SOIL BORING POINT
SB-1
BALTIMORE AVE.
SB-16
SB-9
S. UNION
SB-12
SB-11
SB-13
SB-1
AUSTIN
SB-2
SB-8
SB-4
SB-10
SB-14
SB-15
SB-17
SB-3
SB-5
SB-6
SB-7
SWYCOMBE
LEGION
S. RIGBY
S. MAPLE
SCHAPPELL
SAYERS
NYACK
BARTRAM
CEDAR
INDUSTRIAL PARK
HAZEL
PARK
WALNUT
S. WYCOMBE
S. UNION
E. PROVIDENCE
PAUL
FAIRVIEW
GRAPHIC SCALE
300 0 150 300 600
(IN FEET)
1 inch = 300 ft.
U.S. EPA ENVIRONMENTAL RESPONSE TEAM
FIGURE 2
WELL POINT LOCATION MAP
AUSTIN AVENUE RADIATION SITE
LANDSDOWNE, PENNSYLVANIA
JULY 1995

TABLE 1
Radiological Analyses--Filtered Ground Water
Austin Avenue Radiation Site
July 1995

Sample Location	U-238 (pCi/L)	U-234 (pCi/L)	Th-230 (pCi/L)	Ra-226 (pCi/L)
SB-1F	n/a	n/a	0.12 ± 0.10	0.23 ± 0.09
SB-2F	0.27 ± 0.12	0.22 ± 0.11	<0.1	0.35 ± 0.1
SB-3F	0.41 ± 0.14	0.79 ± 0.20	<0.06	0.52 ± 0.10
SB-4F	3.0 ± 0.4	3.5 ± 0.5	<0.07	0.66 ± 0.1
SB-5F	n/a	n/a	<0.07	0.26 ± 0.09
SB-6F	4.1 ± 0.6	5.0 ± 0.6	<0.06	0.92 ± 0.09
SB-7F	0.25 ± 0.15	0.37 ± 0.17	<0.07	0.46 ± 0.09
SB-8F	0.11 ± 0.07	0.11 ± 0.07	<0.01	0.34 ± 0.1
SB-9F	0.13 ± 0.03	0.13 ± 0.10	<0.06	0.2
SB-10F	n/a			
SB-11F	2.2 ± 0.3	2.7 ± 0.4	0.087 ± 0.071	0.48 ± 0.08
SB-12F	0.19 ± 0.14	0.40 ± 0.19	<0.05	0.21 ± 0.08
SB-13F	0.14 ± 0.11	0.76 ± 0.24	0.083 ± 0.067	0.31 ± 0.12
SB-14F	2.0 ± 0.3	2.4 ± 0.4	<0.1	1.3 ± 0.1
SB-15F	0.67 ± 0.22	0.09 ± 0.25	<0.1	0.68 ± 0.09
SB-16F	0.12 ± 0.08	0.18 ± 0.10	0.09 ± 0.088	0.75 ± 0.12
SB-17F	0.14 ± 0.08	0.08 ± 0.10	<0.2	0.46 ± 0.08

(pCi/L) : picocuries per liter
n/a: data not available